

## PGCET-2023

Seat No. \_\_\_\_\_

SUB: Textile Engineering (Te)

Time: 1 Hour 30 minutes

**Instructions:**

1. Ensure that all pages are printed.
2. Use Black ball pen only
3. Change in option is not allowed
4. There is no negative marking
5. Use of non-programmable scientific calculator is allowed

1.	Density of cotton fibre is approximately			
	A	1.52 denier	B	1.52 g/tex
	C	1.52 kg/m <sup>3</sup>	D	1.52 g/cm <sup>3</sup>
2.	Ziegler Natta catalyst is used in the polymerization of			
	A	PET	B	Nylon
	C	Acetate	D	Polypropylene
3.	The fibre that will float on water is			
	A	Nylon	B	Polyester
	C	Acrylic	D	Polypropylene
4.	The fibre that contain nitrogen and sulfur is			
	A	Polyester	B	Nylon 6
	C	Wool	D	Kevlar
5.	A good fibre forming polymer should not have			
	A	Linear polymeric chain	B	Branched polymeric chain
	C	High DP	D	High inter-molecular interaction
6.	The cross section of spinneret used for producing hollow fibres is			
	A	Rectangular	B	Annular concentric
	C	C Shaped	D	Triangular
7.	The gum in the raw silk filament is			
	A	Wax	B	Sericin
	C	Lignin	D	Fibroin

8.	Apidic acid is monomer for the production of			
	A	Poly (ethylene terephthalate)	B	Nylon 66
	C	Nylon 64	D	Nylon 610
9.	In which of the following polymerization methods the rate of reaction is very high and leads to uncontrolled polymerization?			
	A	Bulk polymerization	B	Solution polymerization
	C	Suspension polymerization	D	Emulsion polymerization
10.	Birefringence of filament yarn is related to its			
	A	Crystallinity	B	Orientation
	C	Density	D	Individual filament denier
11.	20 <sup>S</sup> , 30 <sup>S</sup> , 40 <sup>S</sup> and 50 <sup>S</sup> Ne cotton yarn have the same twist per cm. The yarn having maximum fibre obliquity is			
	A	20 <sup>S</sup> Ne	B	30 <sup>S</sup> Ne
	C	40 <sup>S</sup> Ne	D	50 <sup>S</sup> Ne
12.	The spinning system that does not generate false twist during spinning is			
	A	Ring spinning	B	DREF 3
	C	Rotor spinning	D	Air jet spinning
13.	In a drawframe with 3 over 3 drafting system, the roller most prone to slip is			
	A	Middle top roller	B	Back top roller
	C	Front top roller	D	Front bottom roller
14.	A 25 tex cotton yarn has a twist factor of 30. The yarn twist, in turns per cm, is			
	A	4	B	5
	C	6	D	7
15.	Most of the seed coat particles are removed in			
	A	Blow room	B	Card
	C	Comber	D	Draw frame
16.	A machine that does not improve the mass evenness is			
	A	Drawframe	B	Ribbon lap
	C	Ring doubler	D	Speedframe

17.	Index of irregularity of yarn is approximately			
	A	0.88	B	1.13
	C	1.33	D	1.53
18.	In cotton card, the wire point density on			
	A	Cylinder is lesser than that on flat	B	Doffer is greater than that on cylinder
	C	Cylinder is greater than that on flat	D	Flat is greater than that on doffer
19.	The combing force increases with			
	A	Decrease in mass/unit length of lap	B	Decrease in pre-combing draft
	C	Decrease in needle/cm on half lap	D	Decrease in nips per minute
20.	With an increase in gauge length, the tenacity of a spun yarn would			
	A	Increase	B	Remain the same
	C	Decrease	D	First increase and then decrease
21.	The blending technique that gives the most homogeneous mixing of fibre is			
	A	Lap blending	B	Tuft blending
	C	Sliver blending	D	Roving blending
22.	The bottom roller surface used for driving aprons in ringframe drafting system is			
	A	Knurled	B	Axially fluted
	C	Spirally fluted	D	Smooth
23.	In ring spinning, the tension in yarn is maximum			
	A	Between the lappet guide and front roller	B	Where the balloon radius is the maximum
	C	In winding zone	D	Just below the lappet guide
24.	In a carding machine, in which the following zones the fibre alignment is negatively affected to the maximum extent?			
	A	Cylinder to flats carding region	B	Licker-in to cylinder transfer region
	C	Cylinder to doffer transfer region	D	Doffer to calendar roller region

25.	In which region of ring spinning, Coriolis force acts?			
	A	Lappet to ring cop	B	Delivery pair of drafting rollers to lappet
	C	Back pair of drafting rollers to delivery pair of drafting rollers	D	Feed bobbin to back pair of rollers
26.	Keeping card production same, the quality of carding will improve by setting			
	A	Higher doffer rpm and coarser sliver hank	B	Higher doffer rpm and finer sliver hank
	C	Lower doffer rpm and coarser sliver hank	D	Lower doffer rpm and finer sliver hank
27	The technology that produces yarn with the maximum fibre migration is			
	A	Rotor spinning	B	Air-jet spinning
	C	Friction spinning	D	Melt spinning
28	The purpose of having groove or notches in modern flyer tops in speed frames is to			
	A	Increase real twist in roving	B	Reduce neps in roving
	C	Insert false twist in roving	D	Increase fineness of roving
29	The pair of fibres most prone to accumulation of static charge is			
	A	Cotton and Polyester	B	Polyester and Polypropylene
	C	Silk and Polyester	D	Silk and Polypropylene
30	Ball warping is mainly used in the manufacture of			
	A	Terry towel	B	Narrow fabric
	C	Denim	D	3D fabric
31	Increase in the ratio of the length of crank to the length of connecting rod leads to			
	A	Increase in sley eccentricity	B	No change in sley eccentricity
	C	Decrease in sley eccentricity	D	Initial increase and then decrease in sley eccentricity
32	Pirn winding is an essential preparatory process for weaving on			
	A	Air-jet loom	B	Rapier loom
	C	Water-jet loom	D	Drop-box loom

33	If the diameter of a torsion rod used in projectile loom is double then the torque required to twist it would increase by			
	A	2 times	B	4 times
	C	8 times	D	16 times
34	Patterning is most likely to occur in			
	A	Precision winding	B	Step precision winding
	C	Random winding	D	Pirn winding
35	A 500-end double-lift, single-cylinder jacquard has			
	A	500 hooks and 500 needles	B	500 hooks and 1000 needles
	C	1000 hooks and 500 needles	D	1000 hooks and 1000 needles
36	The filling yarn density at selvage is double in case of			
	A	Fringe selvage	B	Tucked-in selvage
	C	Shuttle selvage	D	Leno selvage
37	The nonwoven process which has the highest production rate is			
	A	Needle punching	B	Melt blowing
	C	Hydroentangling	D	Spunbonding
38	Double acting dobby is driven from			
	A	Bottom shaft	B	Crank shaft
	C	Tappet shaft	D	Rocking shaft
39	The technology/ies used for producing SMS fabric is/are			
	A	Spunlace	B	Needlepunch
	C	Spunlace and Meltblown	D	Spunbond and Meltblown
40	In needle punching process, higher punch density can not cause			
	A	Lower web thickness	B	Higher damage of fibres
	C	Higher change of fabric dimensions	D	Higher permeability of fabric
41	Surface features of a fibre can be obtain by			
	A	Transmission electron microscope	B	Small angel X-ray diffractometer
	C	Scanning electron microscope	D	Sonic modulus tester

42	The least desired feature of fibre in wet laid nonwoven fabric is			
	A	High affinity for water	B	Low aspect ratio
	C	High flexural rigidity	D	Low crimpiness
43	Probability of warp breakage during weaving increases, when			
	A	Warp extensibility is decreased	B	Warp unevenness is decreased
	C	End density is decreased	D	Warp hairiness is decreased
44	A perpendicular laid nonwoven			
	A	Should not contain thermoplastic fibre	B	Exhibits high recovery from compression
	C	Does not form a 3-D structure	D	Cannot be use as replacement of foam
45	With time, wind per double traverse in a drum driven winder			
	A	Increases	B	Remain constant
	C	Decreases	D	First increases and then decreases
46	Consider the following components of a needle: P. Shank Q. Beard R. Barb S. Latch The combination of correct components of a needle in a needle punching nonwoven machine is			
	A	P and Q	B	R and S
	C	Q and R	D	P and R
47	The technology that does not produce a nonwoven fabric is			
	A	Spunbonding	B	Hydroentangling
	C	Meltblowing	D	Braiding
48	The discharging agent used in discharge printing of cotton with reactive dyes is			
	A	Citric acid	B	Sodium dithionite
	C	Thio-urea doxide	D	Sodium formaldehyde sulphonylate
49	Compared to conventional sizing, the wet sizing process reduces			
	A	Size consumption substantially	B	Consumption of drying energy
	C	Weavability of warp yarn	D	Tensile strength of yarn

50	Shrinkage of cotton fabric during wetting is caused by			
	A	Extension of fibre	B	Swelling of fibre
	C	Crimping of fibre	D	Compression of fibre
51	The highest washing fastness in a dyed cotton fabric would be obtained if the dye-fibre bond is			
	A	Ionic	B	Covalent
	C	Hydrogen	D	Van der waal's force
52	Sodium chlorite bleaching of cotton is carried out in the temperature range of			
	A	95-110 °C	B	80-85 °C
	C	50-60 °C	D	30-40 °C
53	Jigger cannot be used for			
	A	Printing	B	Washing
	C	Scouring	D	Dyeing
54	In cotton yarn sizing, the starch primarily acts as			
	A	Binding agent	B	Antistatic agent
	C	Lubricating agent	D	Antimicrobial agent
55	Crease resist finishing of cotton fabric does not lead to			
	A	Reduction in tensile strength	B	Increase in moisture regain
	C	Increase in dimensional stability	D	Increase in bending length
56	A print paste cannot be prepared without			
	A	Colourant	B	Dispersing agent
	C	Thickener	D	Carrier
57	The enzyme used for biopolishing of cotton is			
	A	Cellulase	B	Amylase
	C	Pectinase	D	Lipase
58	Sodium persulphate is used in			
	A	Bleaching	B	Mercerization
	C	Scouring	D	Desizing

59	The relative humidity (in %) and temperature (in °c) of standard testing atmosphere are respectively			
	A	65 and 25	B	65 and 20
	C	60 and 25	D	60 and 20
60	Theoretical limit for mass irregularity ( $CV_{lim}$ ) of a cotton yarn does not depend on			
	A	Mean fibre length	B	Mean fibre fineness
	C	Mean yarn count	D	Coefficient of variation of fibre fineness
61	Nep count in a cotton fibre sample is measured by			
	A	AFIS	B	Uster tester
	C	HVI	D	Stelometer
62	The principle which cannot be used to measure hairiness of yarn is			
	A	Light scattering	B	Photoelectric
	C	Image analysis	D	Capacitance
63	The fibre parameter that cannot be obtained from Baer sorter diagram is			
	A	Mean length	B	Effective length
	C	Span length	D	Modal length
64	The vibroscope methods for determination of fibre fineness does not take into account			
	A	Length of specimen	B	Tension in specimen
	C	Natural frequency of specimen	D	Tensile strength of specimen.
65	During burning, a flame retardant does not			
	A	Increase heat absorption	B	Increase char content
	C	Reduce supply of oxygen	D	Lower glass transition temperature ( $T_g$ )
66	If the numerical value of yarn liner density expressed in Tex and that in English system is the same, this value to the nearest integer is			
	A	22	B	24
	C	28	D	30
67	The property that Kawabata Evaluation System (KES) does not measure is			
	A	Shear rigidity	B	Compressional resilience
	C	Tensile strength	D	Bending rigidity



68	The unique ability of woven fabric to drape in multiple curvatures is mainly due to			
	A	Low shear rigidity	B	High tensile modulus
	C	Low compressibility	D	High bending rigidity
69	The sector-shaped, falling pendulum type apparatus is suitable for measurement of			
	A	Elmendorf tear strength	B	Trapezoidal tear strength
	C	Tongue tear strength	D	All of them
70	Which of the following features is not found in a crepe weave			
	A	Highly irregular surface-puckered in appearance	B	Prominent twill effect on the fabric
	C	Minute sports or seeds spread over the fabric	D	High twist yarn with controlled shrinkage
71	During crystallization of polyester			
	A	Heat is evolved	B	No exchange of heat takes place
	C	Heat is absorbed	D	Small molecule such as water is eliminated
72	A tuck stitch in knitting makes the fabric			
	A	Narrower	B	More rigid in course direction
	C	Thinner	D	Wider and porous
73	Diamond bars appear in woven fabric due to			
	A	Faulty loom parts	B	Periodic fault in warp yarn
	C	Excessive warp irregularity	D	Periodic fault in weft yarn
74	Group A consists of weave designs, Group B lists end use/property. Match design from Group A with the corresponding end use/ property from Group B.			
	<b>Group A</b> P. Leno Q. Honeycomb R. Jacquard S. Crepe		<b>Group B</b> 1. Furnishing 2. Broken and irregular surface 3. Mosquito net 4. Towel	
	A	P-3, Q-4, R-1, S-2	B	P-1, Q-2, R-4, S-3
	C	P-4, Q-1, R-3, S-2	D	P-3, Q-4, R-2, S-1

75	Match the weave in Group I with fabric attribute in Group II.			
	<b>Group I</b> P. Plain Q. 2 up 1 down twill R. 7 end satin S. Mock leno		<b>Group II</b> 1. Holes in fabric 2. High tear resistance 3. High shear resistance 4. Continuous diagonal line	
	A	P-3, Q-4, R-2, S-1	B	P-1, Q-4, R-2, S-3
	C	P-3, Q-4, R-1, S-2	D	P-3, Q-1, R-2, S-4
76	In warp knitting, the lapping movement having only under-lap is			
	A	Closed lap	B	Open lap
	C	Laying lap	D	Miss lapping
77	For the same yarn and fabric sett, the weave that gives the maximum tearing strength is			
	A	Plain	B	2/1 twill
	C	5 end satin	D	2x2 matt
78	Fabric structure related to weft knitting is			
	A	Locknit	B	Reverse locknit
	C	Double tricot	D	1x1 Rib
79	The constant rate of extension type tester is not used for			
	A	Tongue tear test	B	Elmendorf tear test
	C	Wing rip tear test	D	Trapezoid tear test
80	Which of the following fibre(s) is(are) manufactured by melt spinning process			
	P. Viscose Q. Cellulose acetate R. Nylon-6 S. Aramid			
	A	P only	B	Q and R only
	C	R only	D	R and S only
81.	$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin(x \cos x)}{\cos(x \sin x)} = \dots\dots\dots$			
	A	$\frac{\pi}{2}$	B	does not exist
	C	$\frac{2}{\pi}$	D	$\pi$

82.	Which of the following methods is an indirect method for solving a system of simultaneous linear equations?			
	A	Gauss elimination	B	Gauss-Jordan
	C	Cramer's	D	none of these
83.	Which of the following methods does not require prior information about the approximate value?			
	A	bisection method	B	Root squaring method
	C	Newton-Raphson method	D	False position method
84.	If $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ then eigen values of $A^3$ are.....			
	A	1, 1, -2	B	-1, -1, 2
	C	1, 1, -8	D	-1, -1, 8
85.	$s^2 L\{f(t)\} - s f(0) - f'(0)$ is a Laplace transform of...			
	A	$\int f(t) dt$	B	$f'(t)$
	C	$f''(t)$	D	$f'''(t)$
86.	Inverse Laplace transform of $\frac{1}{(s-2)(s-3)}$ is			
	A	$e^{2t} - e^{3t}$	B	$e^{3t} - e^{2t}$
	C	$e^{-2t} - e^{-3t}$	D	$e^{-3t} - e^{-2t}$
87.	Which of the following matrix is in reduced row echelon form?			
	A	$\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$	B	$\begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 5 \\ 0 & 0 & 1 \end{bmatrix}$
	C	$\begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{bmatrix}$	D	$\begin{bmatrix} 1 & 4 & 2 \\ 0 & 1 & 7 \\ 0 & 0 & 0 \end{bmatrix}$
88.	If a vector field $\vec{F}$ is conservative and curve C is closed then $\oint_C \vec{F} \cdot d\vec{r} = \dots\dots\dots$			
	A	0	B	0
	C	non zero value	D	vector function
89.	Which of following is not analytic function?			
	A	$x^2 - y^2 + 2xy i$	B	$x + i 2y$
	C	$x + i y$	D	None of these

90.	$\oint_c \frac{e^z}{z-2} dz = \text{_____}$ , where $c$ is a circle $ z  = 3$			
	A	$2\pi i e^2$	B	$2\pi i e$
	C	$3\pi i e^2$	D	$\pi i e^2$
91.	The function $f(x, y) = x^3 + y^3 - 3x - 12y + 20$ has local minima at .....			
	A	(1, 2)	B	(-1, -2)
	C	(-1, 2)	D	(1, -2)
92.	If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ then $\text{curl } \vec{r} = \dots$			
	A	$\vec{0}$	B	$\vec{r}$
	C	0	D	$x + y + z$
93.	$\frac{d^2 y}{dx^2} + P(x)\frac{dy}{dx} + Q(x)y = 0$ is a .....			
	A	non homogeneous linear equation of the second order	B	Non linear differential equation of the second order
	C	homogeneous linear equation of the second order	D	None of these
94.	In which distribution mean, median and mode coincide?			
	A	Exponential	B	Normal
	C	Poisson	D	Binomial
95.	Which of the following methods is one of the predictor-corrector methods to solve first order linear differential equation numerically?			
	A	Runge-Kutta fourth order method	B	Picard's method
	C	Taylor's series method	D	none of these
96.	The differential equation $kxydy - (x^2 + y^2)dx = 0$ is exact, if $k =$			
	A	$k = 2$	B	$k = 6$
	C	$k = 4$	D	none of these
97.	Statement: A bounded entire function is constant. This statement is of .....theorem.			
	A	Cauchy residue	B	Morera's
	C	Cauchy-Goursat	D	Liouville's
98.	The formula of numerical integration obtained from Newton-Cotes' quadrature formula by putting $n = 1$ is known as .....			
	A	Simpson's one-third rule	B	Weddle's rule
	C	Simpson's three-eighth rule	D	trapezoidal rule

99.	The Wroskian of $\frac{d^2 y}{dx^2} - 4 \frac{dy}{dx} + 4y = f(x)$ is...			
	A	$x e^{-4x}$	B	$e^{4x}$
	C	$e^x(x+1)$	D	$x e^{4x}$
100	Consider the probability function $p(x) = \frac{6 -  x - 7 }{36}$ for $x = 2, 3, 4, \dots, 12$ . What is $p(6 \leq x \leq 8)$ ?			
	A	$\frac{16}{36}$	B	$\frac{6}{36}$
	C	$\frac{5}{36}$	D	none of these